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(54) Title: METHOD FOR COLLECTING AND PROCESSING ANSWERS TO AT LEAST ONE QUESTION
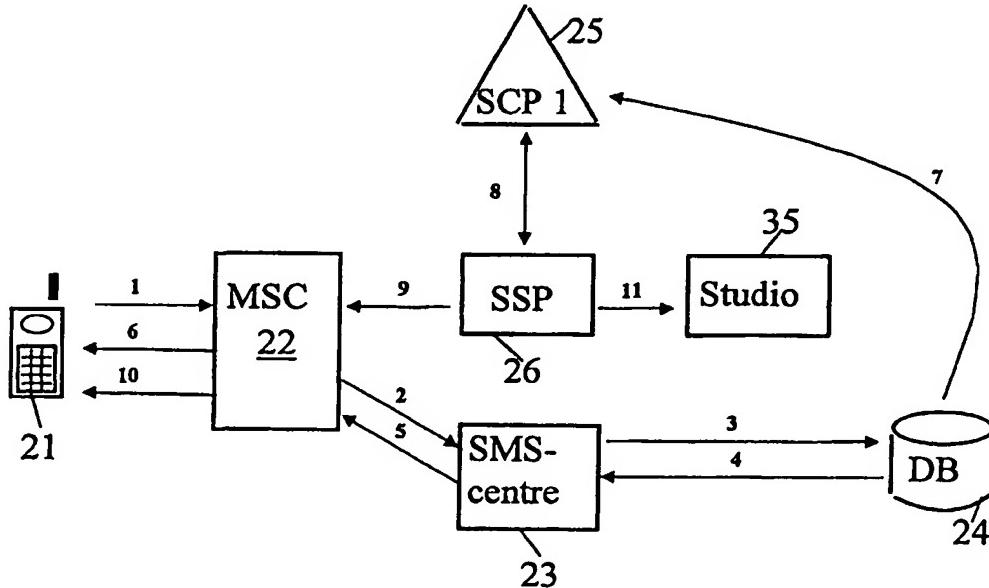
(57) Abstract

The invention relates to a method for implementing a voting service by means of a mobile telephone, in which the vote cast by the mobile phone subscriber is sent using a digital telephone as a short message over radio networks. Confirmation of the casting of the vote is also sent as a short message.

Method for Collecting and Processing Answers to at least One Question

The present invention relates to a method, according to the preamble of Claim 1, for collecting and processing responses to at least one question, requested from a group of people.

Typical cases, in which a number of people are requested to give a response to some specific question include votes, opinion surveys, and opinion polls. The present invention relates to surveys of this kind, and especially to a telephone voting service, implemented by means of a telephone network.

According to the state of the art, voting services and similar have been implemented through a telephone network by the voter calling either a normal subscriber number or a special service number to state her or his opinion to the organizer. When the voting service is implemented using a normal subscriber number, the subscriber number is typically connected to a voice response unit, which is arranged to answer calls. In this case, the voice response unit requests the caller to key in a number corresponding to the alternative to be voted for, and then records the choice in its database for later reporting.

If, on the other hand, a special service number is used to implement the voting service, the control of, and charging for the service can be implemented in a more highly developed way than in the previous alternative. By exploiting the control possibilities in an intelligent network, voting services can be controlled extremely efficiently, allowing as many voting calls as possible to be processed. Because voting services sometimes cause very large loading peaks in the public telephone network, separate voting service areas have been constructed in the telephone network, by means of which other telephone traffic can be protected from the adverse effects of congestion arising from voting. In Finland, one such telephone area code available mainly for voting services is the code beginning with the numbers 0700-7. Voting service performance can be further improved by using an intelligent network's so-called Call Filtering method, which allows the Service Switching Point (SSP) centres of the intelligent network to independently collect even large numbers of voting calls, and only report the numbers of votes according to the calls to the Service Control Point (SCP) at regular intervals.

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Voting based on service numbers also makes it fairly easy to charge for the calls as desired.

However, there are some drawbacks in solutions according to the state of the art. When normal subscriber numbers and voice response units are used, the capacity of the voting service remains quite small. On the other hand, voting services implemented using a service number are vulnerable at times of congestion peaks, unless special protected channels to the telephone network are built for them. The construction of effective protection measures leads in turn to extremely complex solutions, which are both difficult to maintain and expensive.

If the voting service is implemented using a normal subscriber number, the service capacity is typically only a few thousand votes an hour. In a vote of any size at all, this is totally inadequate, and also does not permit any kind of protection measures.

Voting services implemented using a service number ensure a very much better performance than the above, and deal with up to several tens of thousands of votes an hour. A service number also has better load control characteristics. However, unless a service-number-based voting service uses some form of protection, the large load peaks can easily bring down the SCP call-control database, and, locally, even the public telephone network. In such cases, especially the congestion experienced by callers and the resulting numerous call attempts create a huge signalling load, which can rapidly paralyse even large parts of a telecommunications network.

If the voting service is implemented using a service number along with effective protection measures, the costs of establishing the service will be very high. Such a service is also very complicated to set up. So that heavy voting traffic, e.g., more than 50 000 calls an hour, will not interfere excessively with other telephone traffic, separate voting service areas, with their own specific, dedicated lines, must be constructed in the telecommunications network. Though such methods of limiting the number of calls are effective, they are also inflexible and difficult to maintain when the surrounding telecommunications network continuously develops.

In addition, when using a service number, protection of the SCP is always a problem. Protection would be unnecessary, if a single SCP could be dedicated to voting services.

In that case, however, the establishment costs would become very large. Thus, the only alternative is to protect the intelligent network SCP against overloading.

The protection of the SCP is based on the so-called Call Filtering method, in which the SSP centre receives all calls from its own area, gives callers a suitable message and adds the votes cast to the relevant voting alternatives' cumulative counters. In this method, the SCP only collects the totals of the votes, which it receives at regular intervals from the SSP centres. Weaknesses in the Call Filtering method are its difficult activation process and the slowness and difficult control of the recording operations to be made to the numerous SSP centres. The Call Filtering method also does not allow flexible call selection. Call selection means using suitable criteria in the voting service to select certain voting calls, which are then routed to special processing, typically to a TV studio for further questions. In the Call Filtering method, this takes place randomly at pre-set intervals, or once a pre-set number of calls have been made.

In addition, existing methods of implementing a telephone vote have the problem of the messages given to callers when a vote is cast. For example, in the Call Filtering method, which effectively protects the SCP, callers must always be given an identical impersonal standard message, such as 'Your vote has been recorded, thank you for voting!' In such a case, the caller cannot be told which candidate she or he just voted for, or how many votes that candidate had received at the time of the call.

Insufficient capacity is a further, perpetual problem in telephone votes. Though the systems are dimensioned to be as large as possible, it has been statistically demonstrated that, at congestion peaks, all potential voters are not able to vote, but have to make at least a few new calls.

In certain cases, the size of the charge for voting calls can also be a problem. Because pulse metering is used for billing in a telephone vote, the length of the call becomes a critical factor, if it is wished to charge any kind of larger sums. This is because only about two pulses per second can be reliably transmitted to the subscriber's pulse meter. This makes the billing of even slightly larger sums very difficult, as the desire to serve as many callers as possible in a vote means that the message on voting, received by the

caller, is kept as short as possible. However, there is a need for higher charge classes, especially in various votes organized for charity.

The invention is intended to reduce the significance of the technical problems of the state of the art disclosed above and for that purpose to create an entirely new type of

5   method for collecting and processing responses to at least one specific question, requested from a group of people.

The invention is based on all the information, or at least a part of the information, which is collected from respondents to a question or questions, being received incorporated in a short message transmitted through a mobile station network. Thus the respondents

10   send their original responses, or at least a part of them, as a short message. After this, more details of the responses or information from the respondents can, if necessary, be sent by new short message, or by opening a talking connection between the service collecting the information and the respondent.

More specifically, the method according to the invention is characterized by what is

15   stated in the characterizing section of Claim 1.

Considerable advantages are gained with the aid of the invention.

The invention permits more flexible pricing and billing than those presently available for dial-it service numbers. As voting is not charged by metering pulses, the prices of voting services need not be limited only to multiples of the meter-pulse charge. This

20   also permits easy billing even for large sums, without prolonging the voting event unnecessarily.

When the method according to the invention is used, loading of the fixed telephone network is very much lighter than previously. Because the voting services mainly use non-connected short messages, all of the radio network's voice channels also remain

25   available for other telecommunications traffic. Thanks to the structure of short-message transmissions, the voters do not experience possible network congestion in the same way as in conventional telephone votes. If a caller does not receive a confirmation message in a conventional telephone vote, she or he will probably immediately make several new calls, thus adding to the network congestion. After sending a short message,

on the other hand, the voter understands that she or he should wait a longer time for a confirmation, before sending a new short message.

The method according to the invention also permits giving a confirmation in a desired form. The confirmation may be different for voters who have selected different
5   alternative votes, or may vary, for example, according to additional information that comes with the short message.

The invention also provides the producer of the vote with easy control of a voting event, with real-time monitoring of the situation, and with the possibility to select voters, for example, in a live telecast. In addition, the additional information that has come with the
10   short message and been recorded in the database may have further value when collecting statistical data on the special characteristics of support for the different voting alternatives and in analysing possible correlations between those who have selected the same voting alternative. Relevant parts of the additional information can also be used for secondary purposes, as permitted by law.

15   The invention also has preferred embodiments, by means of which the progress of a vote can also be easily monitored in real time through data networks or by sending a separate short message, requesting information on the progress of the vote. The producer of the voting service can easily define the information that she or he wishes to surrender to someone following the vote. Thus a charge can also be made for following
20   the vote, so that the producer of the voting service will gain income, not only from voting, but also from the following of the vote. If the vote is followed by means of data networks, the billing can be carried out by means of typical network billing methods. When the vote is followed by means of short messages, the service can be billed for by applying a higher charge than usual to the sending of such short messages.

25   In the following, the invention is examined with the aid of examples and with reference to the accompanying drawings.

Figure 1 shows one method, in a service implemented by means of which voting can take place using a digital mobile telephone.

Figure 2 shows one service producer's control connection and following of the vote than takes place using a digital mobile telephone.

Figure 1 shows also how mobile network subscriber 21 votes by sending a short message to a certain address. The MSC centre 22 relays the short message to SMS centre 23, which makes a data record of the message. On the basis of the information in the data record, the message is priced in a suitable manner during further processing. The SMS centre 23 relays the short message to the voting service database 24. The voting service database 24 picks the alternative to be voted for out of the short message and records it in its database. It also records other information that may have been requested from the voter and added to the short message. The voting service database 24 sends the voter a short message confirming the vote. Various information, such as a personal greeting or thanks, or information on the present state of the vote, may be added to this confirmation. The confirmation goes first to SMS centre 23, which relays it to MSC centre 22.

If it is desired to select the voter for interview in studio 35, according to the invention the selection can be implemented by using the so-called invocation call function. In the selection event, voting service database 24 sends the SCP database 25 information on a suitable connection for selection. Selection takes place by the SCP 25 sending SSP centre 26 an InitiateCallAttempt (ICA) message and a Continue message. The telephone number of the mobile phone subscriber is then given in the DestinationRoutingAddress field of the ICA message. At the same time, SCP 25 requests the setting of the Event Detection Point (EDP) monitoring the answerback of mobile phone subscriber 21 to SSP centre 26, using message Request Report BCSM (RRB) with criterion DP7-R. In this connection, an FCI message defining the ticket is also sent to SSP centre 26.

The call is next relayed through MSC mobile switching centre 22 to subscriber 21, who answers the call. When the mobile phone subscriber has answered, SSP centre 26 reports the reception of the information to SCP 25, by means of an Event Report BCSM (ERB). After this, SCP 25 sends SSP centre 26 a call Connect operation, by means of which a call is made to the studio. When studio 35 answers this call, a connection is made between studio 35 and subscriber 21. An FCI message defining the ticket can also be sent to SSP centre 26 during this connecting operation.

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Thus, the selection event disclosed above is implemented using the invocation call procedure. The practical implementation used with INAP messages may differ in the future from the solution disclosed above, but the scope of the invention includes all selection solutions operating on the invocation call principle.

5   In the above example, a connection is first formed to mobile phone subscriber 21 and then to studio 35. Naturally, the connection can also be formed in the reverse order, i.e. first to studio 35 and then to mobile phone subscriber 21.

Thus, according to Figure 1, voting by mobile phone subscriber 21, confirmation of the vote cast, and selection of the caller to the studio, can be implemented, for instance, as
10   follows:

1) Person 21, who participates in the vote, uses a digital mobile phone to send her or his vote as a short message to a certain address. The contents of the short message define the alternative being voted for. In addition, other information can also be requested from voter 21 and attached to the short message. Such information is, for example, the voter's
15   telephone number, name, age, or sex. Instead of a normal charge, a surcharge may be made for sending the short message, or the voter may not be billed at all for the transmission.

2) The short message arrives at the MSC centre, from which it is relayed to SMS centre 23, the operations of which are used as a basis for billing in a suitable manner.

20   3) SMS centre 23 sends the short message to voting service database 24, which picks the alternative to be voted for out of the short message and records it in its database 24. At the same time, it records other information that may possibly have been requested from voter 21, and which is also attached to the short message. The other information may typically be the voter's telephone number, name, age, address, or sex.

25   4) Voting service database 24 sends the voter a short message confirming the casting of the vote. Other content can also be attached to the confirmation, such as thanks for voting, a greeting, or information on the present state of the vote.

5) SMS centre 23 sends the short message to MSC centre 22.

6) MSC centre 22 relays the confirmation to mobile phone subscriber 21.

7) For selection, voting database 24 sends SCP 25 information on which connection should be selected to studio 35.

8) SCP 25 sends a request to SSP centre 26 to set up a call to mobile phone subscriber 21 and to monitor the answer message from mobile phone subscriber 21.

9) The request is sent to mobile phone subscriber 21 through MSC mobile switching centre 22.

10) Mobile phone subscriber 21 answers the call.

11) SSP centre 26 reports the information on the reply of mobile phone subscriber 21 to SCP 25. SCP 25 sets up the call to studio 35 and then forms a call between mobile phone subscriber 21 and studio 35.

Figure 2 in turn shows how the producer of the voting service typically controls her or his database 24 through data networks, for example, by means of a www-based user interface 31. By means of user interface 31, the producer of the voting service can activate or deactivate the vote, gather various statistics on the vote, study the distribution of different opinions on the basis of different criteria, and request the creation of a selection call to the desired mobile phone subscriber.

A person following the vote can contact voting service database 24, for example by means of a computer and a web browser, and access information on the progress of the vote, delimited as desired by the producer of the voting service. The information can be sent on the basis of either a query or a response. This can be done, for example, by accessing the producers website and requesting the voting data, which are suitably available from the producer's website. Alternatively, the so-called 'push method' can be used, in which the producer's database continually sends new information on the progress of the vote, at a time agreed separately.

The vote can be followed using a digital mobile phone 41, by sending a short message with an appropriate message to a specified address. MSC centre 22 relays the short message to SMS centre 23, which, on the basis of the operations, prices the short

message as desired. SMS centre 23 relays the short message to voting service database 24, which picks the information relating to the query from the short message that it has received.

On the basis of the query, voting service database 24 sends a short message containing the desired information to SMS centre 23. SMS centre 23 relays the short message to MSC mobile switching centre 22, which routes the short message to the digital mobile phone 41 of the person following the vote.

Thus, the service producer's control interface and monitoring of the vote can be implemented using the Internet or a digital mobile phone in the following manner, according to Figure 2:

51) The voting service producer typically controls her or his voting service database 24 through data networks, for example, through a www-based user interface 31. By means of her or his user interface 31, the voting service producer can active or deactivate the vote, gather various statistics on the vote, study the distribution of different opinions on the basis of various criteria, and request the formation of a selection call to a desired mobile phone subscriber.

52) A person following the vote contacts voting database 24 by means of her or his own computer and web browser 32, through data network 60.

53) A person following the vote from voting service database 24 gets information on the progress of the vote, delimited as desired by the voting service producer.

54) The vote can be followed using a digital mobile phone 41, by sending a short message with a suitable content to a specified address.

55) MSC centre 22 relays the short message to SMS centre 23, on the basis of the operations of which it is priced as desired.

56) SMS centre 23 sends the short message to voting service database 24, which picks the information relating to the query from the short message it has received.

57) On the basis of the query, voting service database 24 sends back a short message containing the desired information.

58) SMS centre 23 relays the short message to the MSC mobile switching centre 22.

59) MSC centre routes the short message to the digital mobile phone 41 of the person following the vote.

One significant alternative embodiment of the invention is the use of the Wireless Application Protocol (WAP) concept in connection with the method. WAP is a data transfer architecture similar to the Internet, which takes into account the special requirements of wireless data communications. Once it is implemented, the WAP concept will permit web browsers to be integrated in mobile terminal devices, allowing fuller exploitation of the narrow transmission band of a radio channel. WAP will be fully integrated with the Internet, with all the components of Internet architecture having corresponding components in WAP. For example, the HMTL language and Java scripts of the Internet are replaced in WAP by corresponding WML (Wireless Markup Language) and WML scripts. In practice, conversion between these two instruction sets takes place in so-called Filter elements, unless the web server in question recognises that the information should be sent to the relevant mobile terminal device in WAP format.

In this case, the mode of data transfer based on short messages according to the invention will be retained, but in practice the user will not see the short message to be sent, instead she or he will use the WAP browser of the mobile terminal device. When the user of the terminal device wishes to participate in a vote using this WAP browser, she or he will go to the voting service producer's website, cast her or his vote, and receive confirmation of this on the browser of her or his own terminal device. In practice, however, the data transfer will take place in both directions as one or more short messages. The advantage of short messages over a switched connection (e.g. GSM 13 kbit/s) in this case is greatly increased data transfer efficiency, both in the radio channel and in the telecommunications network. Sending and receiving a few short messages requires only a fraction of the capacity required by a switched transmission channel. In addition, it is easier to ensure the delivery of packet-type short messages by various relay methods, because the transfer is not time-critical.

In addition, voting in a voting service or following the vote by means of a digital mobile phone can be billed, using the WAP concept, by means of data network billing methods, instead of short messages. In this case, for example, voting takes place by going to the producer's website through a WAP browser, casting a vote, and simultaneously

5   approving payment for the transaction. Following the vote uses a corresponding principle. The user of the voting service then receives a bill along with the bills for other web services.

In connection with the invention, voting means expressing an preference for persons, opinions, prices, or other matters. Thus the areas of application of the invention include

10   political advance voting and other elections, market research, and popular votes on such things as the popularity of pieces of music.

Claims:

1. A method for collecting and processing the responses requested from a group of people to at least one specific question, which method comprises

- receiving the responses provided by several persons through a telephone network,

- collecting the responses received in a database (24), for the further processing of the information contained in the responses,

c h a r a c t e r i z e d in that at least part of the response data received from each person is received incorporated in a short message transmitted through a mobile station network (41, 22).

2. A method according to Claim 1, c h a r a c t e r i z e d in that, after reception of the short message transmitted by the mobile station network (41, 22), confirmation of reception of the data contained in the short message is sent as a short message to the terminal device that has sent the short message received and/or to the terminal device using the mobile station network subscriber connection used for sending.

3. A method according to Claim 1 or 2, in which part of the information to be collected is collected by means of a talking connection, c h a r a c t e r i z e d in that, after reception of the short message received through the mobile station network (41, 22), a talking connection is formed between a voice response unit connected to the information collection system (24), or the network terminal device of the person collecting the additional information, and the mobile station network terminal device that has sent the received short message, or using the subscriber connection (21) used to send it.

4. A method according to one of Claims 1 – 3, c h a r a c t e r i z e d in that the information contained in the responses recorded in the database is controlled in real time with the aid of a computer (32) and through a data network (60).

5   5. A method according to one of Claims 1 – 4, c h a r a c t e r i z e d by

- analysing the received responses,

- recording the distribution of the responses in the database (24), and

- providing a user interface (32, 41) for examining the distribution of the responses recorded in the database (24).

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6. A method according to Claim 5, c h a r a c t e r i z e d by

- receiving a short message, in which certain information is requested, sent from the mobile station system terminal device (41) of a person desiring information on the distribution of the responses, and

15   - sending the requested information as a short message to the mobile station network terminal device (41) of the person desiring the information.

7. A method according to one of Claims 1 – 6, c h a r a c t e r i z e d in that the response received as a short message contains the vote cast by the person, information
20   on the person's opinion, or other information concerning the person.

8. A method according to one of the above Claims, c h a r a c t e r i z e d in that the person (21) casting the vote is selected for interview in the studio (35) with the aid of an invocation call.
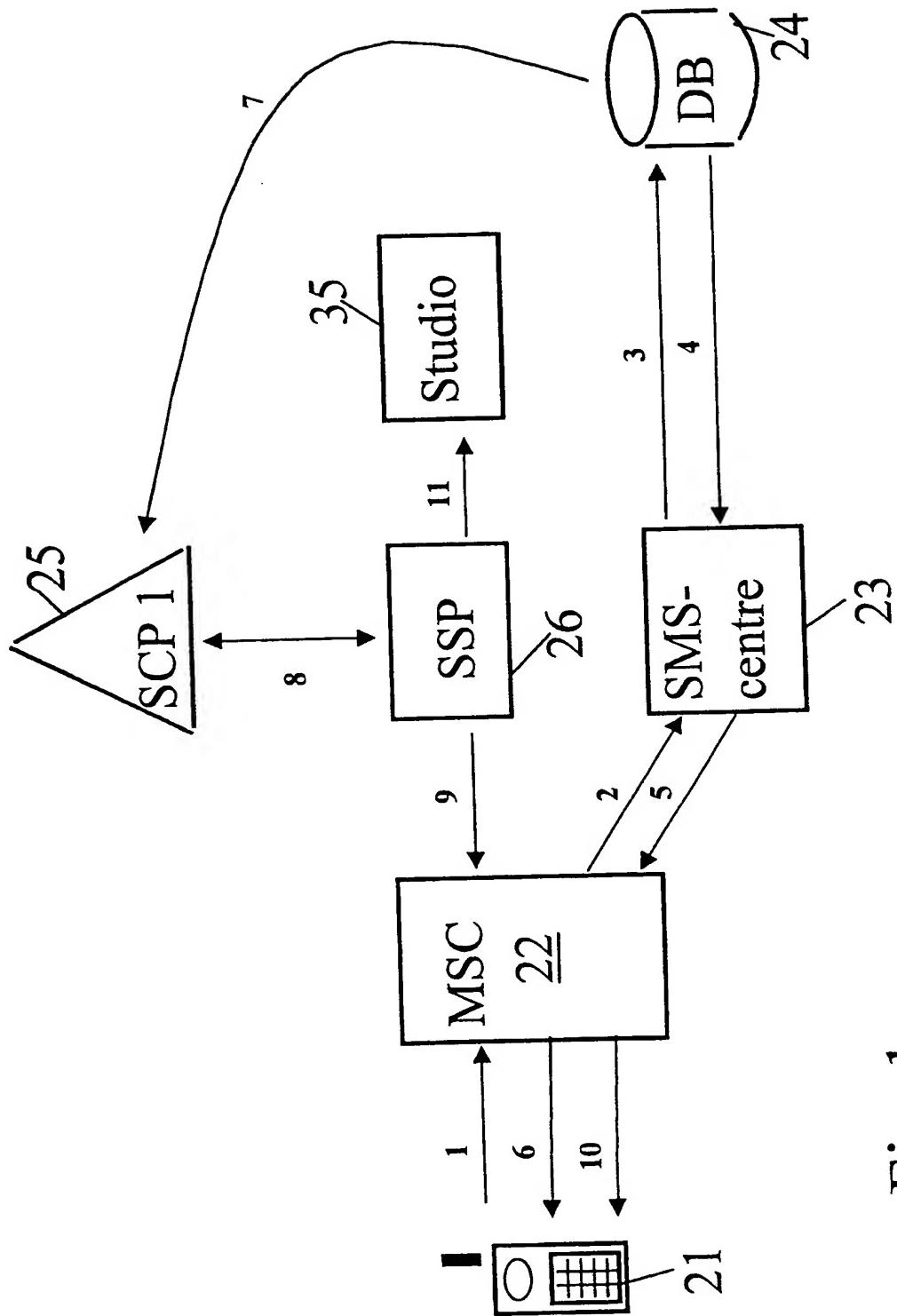
Fig. 1
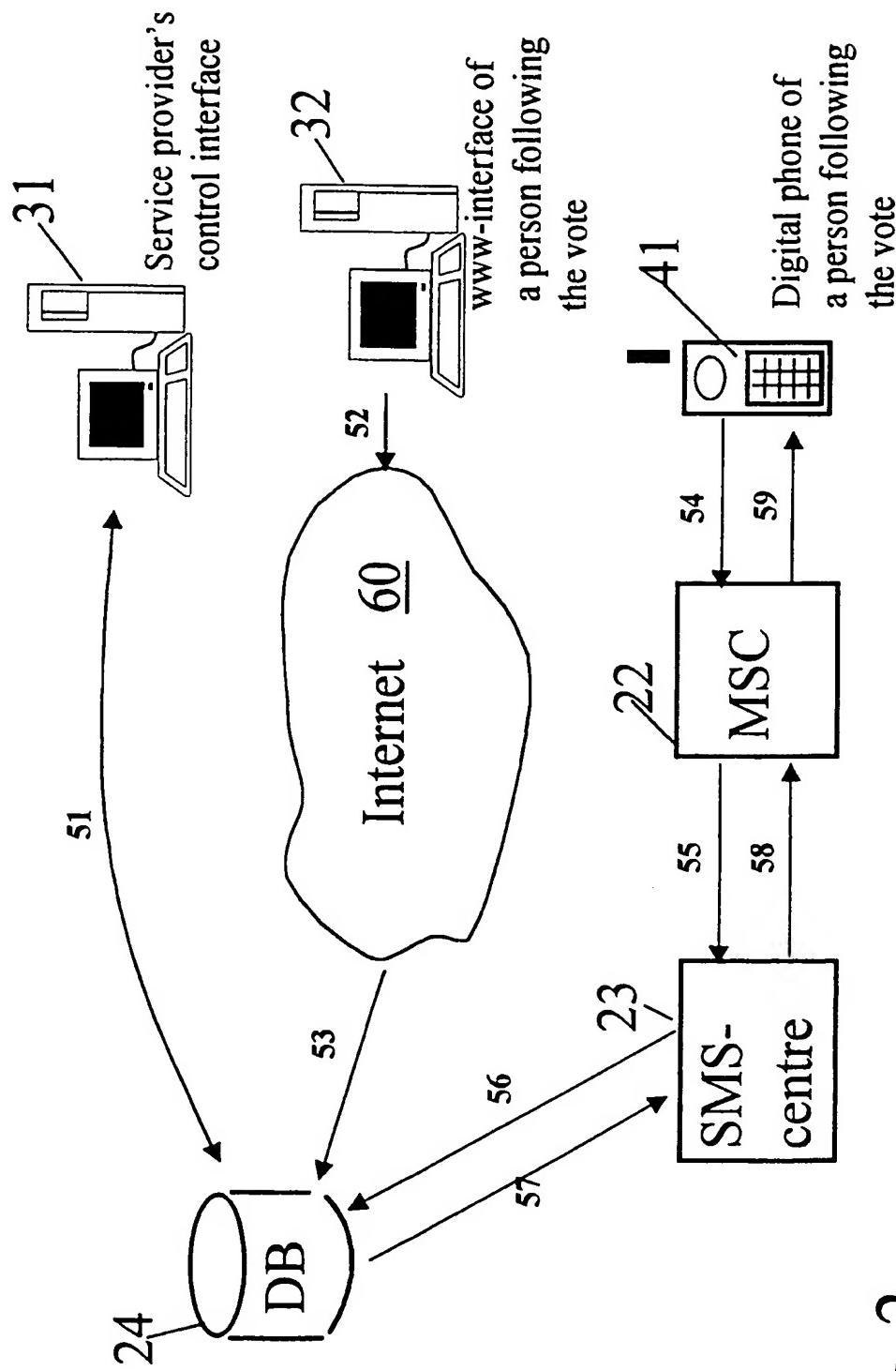
Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 99/01093

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04Q 7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication. where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9809451 A1 (NOKIA MOBILE PHONES LTD.), 5 March 1998 (05.03.98), see the whole document	1-8
A	EP 0833469 A1 (PIEPOLI, NICOLA ET AL), 1 April 1998 (01.04.98), page 2, column 1, line 1 - column 2, line 22	1-8

☐ Further documents are listed in the continuation of Box C.   ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" erlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search	Date of mailing of the international search report
14 June 2000	16 -06- 2000

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Form PCT/ISA/210 (second sheet) (July 1992)

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9809451 A1	05/03/98	AU 3944197 A FI 963375 A	19/03/98 01/03/98
EP 0833469 A1	01/04/98	IT 1285517 B IT MI962003 A	08/06/98 30/03/98

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